NASA ACADEMY

WHAT IS THE NASA ACADEMY?

History

The NASA Academy was started as the "NASA Space Academy" in 1993 at Goddard Space Flight Center by Dr. Gerald Soffen, Director of the Office of University Programs. Simply put, the Academy was intended to be "something more" than the usual student internship at NASA. The students of the Academy would be a small group of the best and brightest, recruited from across the country. They would be given many opportunities others could only imagine. At the end of their 10 week term with the Academy, these students will have been exposed to as many facets of NASA and other areas of the space program as possible.

Concepts

The success of the space program results from the interaction of government, academia, and the private sector, each playing a critical and different role. The NASA Academy is a ***unique*** institute of higher learning whose goal is to help guide future leaders of the space program by giving them a glimpse of how this system works. The intent of the Academy is to give the selected students a working knowledge of NASA and its programs and to provide insight into all of the elements that make the NASA missions possible.

NASA Academy Mission Statement

To develop students morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career of aerospace service; and, have potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government.

To develop leadership and research skills in their particular field of interest.

To create an environment in which determination, creativity, and enthusiasm combine to produce exceptional results.

To create an environment in which students learn that oftentimes the most innovative ideas and projects result from combined brainpower.

"The NASA Academy is a once-in-a-lifetime experience. In a ten week period one learns more about NASA, government and industry relations with NASA, people, and oneself. It is an intense time of learning, experiencing, researching, meeting new people, making life-long friends, and basically having a great time. Not for those who enjoy relaxing, only for those with an intense desire to lead, and to learn about leading." -Todd C. '94

WHERE IS THE NASA ACADEMY?

Word of the Academy at Goddard Space Flight Center was spreading to other NASA centers. In 1994 another Academy was started at Marshall Space Flight Center, although currently the Marshall Academy is inactive. In 1997, the Academy was expanded to the west coast both at the Ames Research Center and the Dryden Flight Research Facility. It is intended that more Academy posts at different NASA centers will allow more students to attend the Academy, enabling students to pick a NASA center that is best aligned with their own scientific interests. The spread of the Academy system required a name standardization to prevent confusion and to reflect the diverse interests of the NASA mission. Each individual Academy is specifically referred to as "NASA Academy at Goddard Space Flight Center" or the "NASA Academy at Dryden Flight Research Center."

WHEN IS THE NASA ACADEMY?

The 10-week program at Goddard begins on the first Saturday in June and ends on the second Saturday in August. For Ames, it begins on the third Saturday in June and ends on the last Saturday in August. At Dryden, the 12-week begins on the last Saturday in May and ends on the third Saturday in August. These dates were selected to give most students a breather before returning to school. We know this is a compromise, as no two schools have identical schedules; however, it is important that all RAs begin together and all end together.

WHO MAKES THE NASA ACADEMY?

The Academy is designed to be run as a joint effort of the Academy Staff and the RAs. There are more RAs than staff, and it is generally expected that the RAs will handle as much of the workload as possible to allow the Staff to handle those tasks which would be difficult for the RAs to accomplish alone. The Academy is meant to be a shared, collaborative experience.

Academy Staff

Founder and NASA Academy Director-*Dr. Gerald A. Soffen*
Also the Academy Program Director and Director of University Programs at Goddard Space Flight Center. Dr. Soffen opens the gateway to the 'Experts' who will interact with the Academy and is a great source for connections to many sources within NASA, and to the industry in general.
Dr. Soffen also appoints Academy Executive Committee Staff, and is the final authority in the Academy. He directs the staff efforts for Academy planning and sets the strategic planning for future activities. However, he prefers that the RAs make the decisions about Academy activities.

Jim Brice (former general manager), Program Director Dr. Gerald Soffen Steve Sanders (former general manager) at NASA Goddard Space Flight Center.

General Manager
Manages day-to-day operation of Academy. Serves as staff director. Oversees Academy budget goals and priorities. Implements Academy academic objectives.

Academic Deans
Two visiting professors with the Summer Faculty Fellowship Program responsible for providing academic counseling to the RAs on both their individual project and the seminars that they attended as a group. Provides counsel to Program Director on individual RA performance and the strategic vision for NASA Academy.

Alumni Staff
The alumni staff are Academy participants of previous summers. They arrange all of the activities for the summer and provide overall coordination for logistics, operations, communication, and RA counseling. Alumni staff act as facilitators for the RA Committees.

Research Associates
The Research Associates are the student/researchers of the Academy.

Responsibilities generally boil down to:

- Attend all Academy functions (guest speakers, rap sessions, trips)
- Work with their PI on their individual project
- Assist in running the Academy
- Give presentations on their work over the summer

The RAs function as a ***team***, making as many decisions on Academy proceedings as is possible and practical. RAs are expected to devise a system amongst themselves to best accomplish this. The Academy is basically a democracy. Generally, specific tasks and Academy functions may be delegated to be worked on by smaller groups of RAs.

WHO FUNDS THE NASA ACADEMY?

The NASA Academy program is co-sponsored by the participating NASA Center and the National Space Grant College and Fellowship Program. Students submit their applications to the Lead or Affiliate Space Grant Consortium office in their State. These applications are screened and forwarded to the appropriate NASA Academy program. Most State Space Grant Consortium offices, as well as the Space Grant offices of the District of Columbia and Puerto Rico, support the program. Please check with the Space Grant office in your state for participation information. Space Grant Consortia offices agree to provide the students with summer stipend support and round-trip transportation to and from the participating NASA Center. The participating NASA Center agrees to host the student, providing housing, local transportation and meals.

WHO IS ELIGIBLE?

Those interested in applying for the NASA Academy must be / have:

- Demonstrated Interest in the Space Program
- Enrolled as a junior, senior, or graduate student (as of June 1 of the program year)
- Maintaining an overall B average (minimum)
- Majoring in science (physics, chemistry, biology, etc), math, engineering, computer science, or other areas of interest to the space program
- Be a US citizen or permanent resident (as of June 1 of the program year)

SELECTION PROCESS

Each student, also called “Research Associate,” or “RA,” will be hand picked by a series of gates, panels, interviews, etc., starting with their own State Space Grant Consortium who has selected and agreed to sponsor them. Students will work with researchers who have themselves been selected through a highly competitive process for selecting only the best, the brightest, and the most innovative. The "match" between student (Research Associate) and researcher (Principal Investigator) will be done by mutual selection.

”Whenever I am asked to relate my Academy experiences, I find it difficult to express in words what was for me a uniquely indescribable adventure. But if words are required, here are a few…intense, rewarding, exhausting, inspiring and unforgettable.”

Jake Lopata – Academy ‘95

THE ACADEMY EXPERIENCE

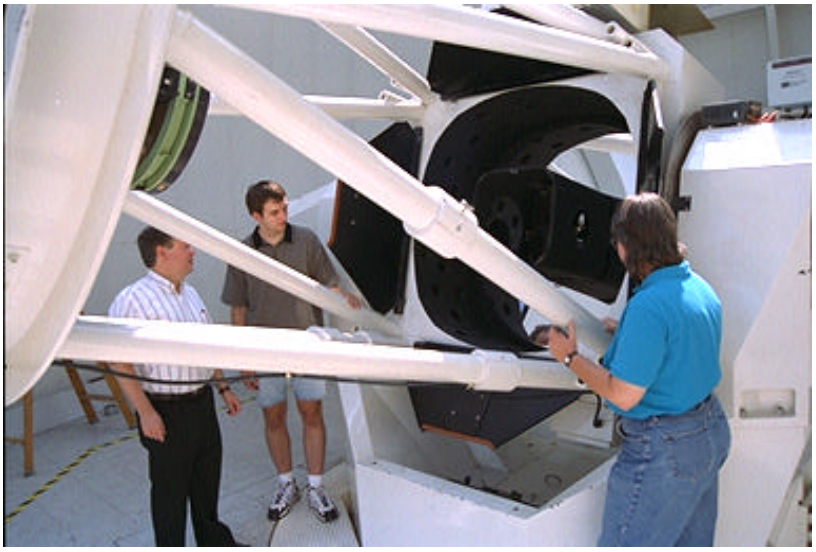
Although some elements of the Academy Experience differ, depending on which NASA center is attended, there are four main elements that remain the same. These elements include mentored research in one of our finest laboratories, "expert" sessions with leaders in government, industry, and academia, on site inspections of other NASA facilities and Centers, and a group project developed by the RAs as a team.

"The Academy is the definition of a full-time experience - if this was the summer you planned on catching up on your reading or exercising 4 hours a day - forget it! The three most important qualities you need to have are a PASSION for space and the future, a COMMITMENT to the Academy (you must "give yourself to the Academy), and enough CONFIDENCE in yourself to believe you can change the world. Over only ten weeks you will garner more useful, real-world knowledge than you did all through college, meet an incredible number of brilliant and exciting people, and supply yourself with more tools than you could ever use to achieve your highest goals!"

-Eric A. '95

What Projects Do the RAs Work On?

Each research project is part of the Director's Discretionary Fund (DDF) program. These projects are specially selected by the Center Director because of their "cutting-edge" potential. The students are expected to spend about half of their time during the 10 weeks working with their PI (Principal Investigator) on the DDF research project assigned to them at the beginning of the Academy session. Work varies widely, depending on the PI, the project, and the RAs capabilities. Some require more diligence than others. Some are more hands-on, while others are more research oriented.



Research Associate Matthew Weatherly (GSFC '98) works with his PI on his project.

Group Activities

Besides the individual research projects, the trips, and the experts, there are several group activities that add to the "Academy Experience." Academy does not only take place at work--it is a way of life. After the RAs go back to the house, they still have commitments to the Academy, and since most of their time during the day is spent either with their PIs or with Guest Speakers, the evenings are a time for other Academy functions.

Living Arrangements

In order to promote more of a "group" environment and to provide more immediate services, all Academy RAs live together. Living arrangements are different for each Academy, depending on the participating center. The Ames Academy stays in a large house, and the Goddard Academy does the same. The Dryden Academy stays in adjacent apartments. RAs usually have dinner together. Sometimes the Academy will have guest "experts" over for dinner.

Spece Entrepreneur Peter Diamandis of the X-Prize with the Academy staff after dinner.

Group Project

In addition to RA's individual projects, it is recommended that the RAs work together as a whole on a group project. The nature of this project is totally up to the RAs. A group project gives all RAs a chance to work *together* toward a specific goal, since most of their scientific work will be done separate from the Academy members with their PI's.

Academy I (GSFC) worked on a comet impact study, and on creating a slide presentation about the NASA Academy for promotional and recruitment

purposes. Academy II (GSFC) worked on the proposal of the CLASS project, with the goal of involving all American schoolchildren in space based experiments to inspire an interest in space and science. Academy III (GSFC) composed a feasibility study on using the SR-71 as an airborne launch platform. In addition, Academy III initiated the formation of an alumni organization. In cooperation with their compatriots at the Marshall Space Flight Center Academy, Academy IV(GSFC) put on a multi-media presentation for the commemoration of the 20th anniversary of the Viking Landing and the upcoming Mars Missions. Academy V (GSFC) has been funded by NASA Headquarters to develop and implement an outreach program called "Kids in Space." Academy VI (GSFC) developed a feasibility study of designing an Easy Low-Cost Lunar Explorer (ELLE), whose scientific objective was to prove the existence of lunar ice. Academy VII (GSFC) split into two groups, one working on a feasibility study of terraforming Mars with terrestrial bacteria; the other developed a mission to Saturn's moon Titan and designed a lander for that mission.

The Dryden group project will involve designing and implementing flight research projects on a radio-controlled and highly instrument F-18 model. These projects might include measuring performance characteristics, parameter identification, or control laws design. The goal of the project is to familiarize the students with the processes involved in flight research. Each year the students will work on a different research project with the F-18 model.

RA Committees

Each year, the NASA Academy takes on a very different character simply because of the new personalities that take part. Each RA, through taking an active role, has the power to build upon the foundation of the program that currently exists and mold their Academy into a unique experience.

The RAs are encouraged to show initiative and contribute to the program whenever they see the opportunity. Some of these opportunities will come about through organized activities, but others only through their own creativity and initiative.

Before arriving for the summer and again during the first week of the program, the RAs are asked to form several of these "committees." Certain responsibilities are identified immediately, for example: organization of local transportation to work each day. Other responsibilities are determined partly by what activities the group wants to undertake. While much of the program has already been planned out prior to their arrival, many areas have been left open for the RAs to organize as they wish.

Rap Sessions

Rap sessions are large group meetings that include all RAs and some or all of the Staff. This is the forum for discussion and policy making for the Academy. Much information is exchanged and/or distributed in rap sessions. Attendance is critical to stay informed of future events and have input into the decisions.

Rap sessions are the meat and potatoes of the NASA Academy. Rap sessions are very important and each RA is an important part of every one. Rap sessions are hard to define, mainly because their structure is determined by the individual RAs participating in the Academy at the time. They can be orderly or chaotic, cooperative or debating, focused or wide-ranged (all traits that can be both desirable and hindering); this all depends on the make-up of the Academy.

Rap sessions are part town meeting, part open forum. It is the government of the Academy. The actual structure and procedures to be adopted in rap sessions are up to the RAs. They are usually scheduled in the evenings, and usually take place at the house. However, an impromptu rap session may be held before or after any other meeting where all RAs are expected (a guest speaker, a field trip). At least one rap session is scheduled and held every week of the Academy. This rap session is for the staff to be able to pass on any and all important information on Academy activities for the upcoming week.

Presentations and Graduation

About halfway through the Academy, the RAs are required to participate in a poster session, reporting the progress of their research. At the end of the Academy, the RAs must give a final oral presentation to an audience of experts, fellow research associates, and Academy alumni. Immediately following the presentations, there is a graduation ceremony where each participant is presented with a plaque.

Center-Specific Activities

Depending on which NASA Academy you attend, each one meets with different speakers and takes different trips.

NASA Academy at Ames Research Center

The Ames Research Center (ARC), located at Moffett Field, California, in the heart of Silicon Valley, specializes in revealing new knowledge about the universe, planetary systems, and life and in creating new technologies that enable exciting new ventures in aeronautics and space exploration. Ames is unique in having world class ground, airborne, and space flight research capabilities in aeronautics, astrophysics, earth sciences, exobiology, fluid dynamics, gravitational biology, thermal protection technology, computational chemistry, planetary atmospheres, space laboratories, information sciences, and spacecraft life support.

This multidisciplinary synergy has created the world's only capability for the comprehensive study of **Astrobiology** – life's origin, evolution, distribution in the universe and destiny, from the protection of our planet to the evolution of terrestrial life into space.

Ames is the lead center for Astrobiology and is also the lead NASA Center for understanding the effects of gravity on living things. Ames plays a major role in

understanding the origin, evolution, and distribution of stars, planets, and life in the universe. Ames also conducts unique research in atmosphere and ecosystems science; and is the lead center in providing thermal protection systems that are critical for future access to space and planetary atmospheric entry vehicles.

The NASA Astrobiology Academy in the past has had 11-15 students. Besides the domestic experts, they have listened to leaders from the aerospace, high-tech, and genetic engineering firms in Silicon Valley; local, state, and national political decision makers; international partners; advocates and adversaries of space exploration.

The itinerary begins with team building exercises, and then a trip to San Francisco to visit the Exploratorium and Tactile Dome. They also have a bonding trip to Tahoe, where they go white-water rafting. Other trips include: Jet Propulsion Laboratories, Desert Research Institute in Nevada, Lawrence Livermore Laboratories, Dryden Flight Research Center, SETI Institute, Lockheed SkunkWorks, the Vandenburg Air Force Base, and even Disneyland / Universal Studios! They meet with speakers such as Dave Morrison, Chris McKay, Jeff Cuzzi, Kevin Zahnle, Muriel Ross, Sherwood Chang, and Don De Vincenzi.

NASA Academy at Dryden Flight Research Center

The Dryden Flight Research Center (DFRC) is NASA's premier installation for aeronautical flight research. It is located at Edwards AFB, California, on the western edge of the Mojave Desert 80 miles north of metropolitan Los Angeles. At Dryden, engineers and scientists explore the realm of flight, turn ideas into reality, and make discoveries used in the design of future aircraft.

In addition to carrying out aeronautical research, the Center also supports the space shuttle program as a primary and backup landing site, and as a facility to test and validate design concepts and systems used in development and operation of the orbiters.

The history of the Dryden complex dates back to the summer of 1946 when a group of five aeronautical engineers arrived at what is now Edwards from NACA's Langley Research Center, Hampton, Va., to begin preparing for the X-l supersonic research flights in a joint NACA-Army Air Corps program.

Since the days of the X-l, the first aircraft to fly faster than the speed of sound, the installation has grown in size and significance and is associated with many important milestones in aviation—supersonic and hypersonic flight, wingless lifting bodies, fly-by-wire, supercritical and forward swept wings, and the space shuttles.

The motto of the DFRC, "...to separate the real from the imagined problems and to make known the overlooked and the unexpected problems." comes to us from Hugh L. Dryden, after whom the Center is named. It highlights the "show-me" approach to aeronautical research practiced at Dryden. Aeronautical theory becomes reality at Dryden. Engineers at Dryden are comfortable with the most obscure mathematics and aircraft hydraulic fluid. People that visit DFRC marvel

at the opportunity to experience the whole panorama of activities from inspiration to design, from construction to flight testing, and from data analysis to interpretation. Clever students working with the proper guidance during the summer months get a real taste of this.

Since the Academy at DFRC only has around six students, the opportunity for individual growth and attention is unique. About 40% of the working time and most of the social time of the students will be spent as a "group" or "team " in plenary sessions. This time will be devoted to the exchange of ideas, on forays into the highest level of decision making, prioritizing, planning, and executing aeronautical research. This will be done by interviews with leaders and motivators at DFRC. Besides the domestic DFRC 'experts', they make trips to speak with experts at Ames Research Center, Jet Propulsion Laboratory, Goddard Space Flight Center, Washington DC, and various business companies. The other 60% of the working time will be spent working on the technical project with the various principal investigators.

NASA Academy at Goddard Space Flight Center

The Goddard Space Flight Center is home to over 3000 civil servant scientists and engineers as well as 9,000 contractors, guests, and students. The largest of the NASA centers, Goddard serves as the scientific flagship of the agency.

Goddard's mission is to enable discovery through leadership in Earth and Space Science, and to create the technologies that support and advance the science objectives. GSFC missions such as COBE, GRO, WARS, LANDSAT, TRMM, SOHO and the First, Second and Third Hubble Space Telescope Servicing Missions bring new data that allows both academia and industry to better understand the world and the universe. At Goddard, success is not measured in launches, hardware, or spacecraft; it is measured in discoveries, ideas, and understanding.

The 1996 Goddard and Marshall Academies in front of the Goddard Academy house..

Starting on the weekend, the RAs get off to a fast start as the first day of the program begins with an orientation session held at the National Air and Space Museum followed by a tour of Washington D.C. The tour ends at the home of Dr. Gerald Soffen, Director and Founder of the NASA Academy, where the group holds its first meeting to discuss the remainder of the summer. During the course of the first week the RAs are orientated to Goddard, acclimated to their research, and introduced to Mr. Al Diaz (GSFC Center Director), Dr. Julius Dasch (National Space Grant Director), and Dr. Pat Dasch (Executive Director of the National Space Society). The first weekend is used to participate in an astronomy and geology field trip, and engage in team building exercises.

In the past the RAs have met with officials from NASA Headquarters (HQ) such as the Administrator, Mr. Dan Goldin, and several of the Associate Administrators. They have also met with both the upper management at Goddard including several of the directorate heads as well as numerous outstanding scientists and engineers currently working on center. In addition, the RAs have met with representatives from Lockheed Martin, Boeing, Orbital Sciences, and the X-Prize, as well as professors currently teaching classes at prestigious universities in aerospace related fields.

The 1998 Goddard NASA Academy visiting Wallops Flight Facility.

Field Trips to other centers provide the RAs with first hand knowledge of both what and how tasks are accomplished at other NASA field centers. The RAs have visited the Langley Research Center (LRC), Wallops Flight Facility (WFF), Kennedy Space Center (KSC), and the Goddard Institute for Space Studies (GISS). The Langley Research Center is located in Hampton, Virginia and is the Agency's focal point for wind tunnels and test facilities and as such devotes 70%

of its effort towards working to improve today's aircraft and to developing concepts for future aircraft. From the Kennedy Space Center located at Cape Canaveral Air Station in Florida, many of the past Academies have had the opportunity to witness a shuttle launch. In addition, they have toured facilities such as the Orbiter Processing Facility (OPF), and the Vehicle Assembly Building (VAB). The Goddard Institute for Space Studies located on Manhattan Island in New York City and the Wallops Flight Facility located on Chincoteague Island in Virginia are both part of the GSFC and as such are under the same upper management structure as Goddard. The RAs have visited each facility, participated in a unique tour, and have met the individuals that make each of these facilities function. In addition, the NASA Academy from the Dryden Flight Research Center (DFRC) visits and intermixes with the Goddard Academy to provide the RAs from both centers with some of the insights that they have obtained from their perspective centers.

THE NASA ACADEMY ALUMNI ASSOCIATION

Today over 250 students have been through what the vast majority of them will tell you was the most intense, exciting, educational, and rewarding ten weeks of their lives. But, the experience did not end with the close of the summer; it is still living, breathing, and maturing in the students who have had the opportunity to participate. Because--for most of them--the Academy program has changed their lives, the Alumni have decided to officially establish the NASA Academy Alumni Association (NAAA). The mission of the NAAA is to:

- Ensure the quality of the NASA Academy programs
- Promote communications, fellowship, camaraderie, and an esprit de corps among all Alumni
- Provide a mechanism to facilitate Alumni participation in programs and projects which promote NASA and space education, and which communicate the excitement of space exploration and development

For additional information on the NASA Academy Alumni Association, visit:

http://www.nasa-academy.org/

"The NASA Academy is a tool for making your dreams into reality. It provides the right framework and opportunities for developing the maturity and gaining the knowledge needed to interact with today's engineers and scientists." Rob Bayt -Academy '93

HOW CAN I LEARN MORE ABOUT THE NASA ACADEMY?

NASA Academy information is obtained through these sources:

Internet: **http://www.nasa-academy.nasa.gov/**

Goddard Space Flight Center
Telephone & email: Vanessa Stroh
Tel: (301) 286-8733 Fax: (301) 286-1610 email:
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http://academy.gsfc.nasa.gov/ gsfc.html

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Ames Research Center
Telephone & email: Dr. Doug O'Handley
Tel: (650) 604-3525 Fax: (650) 604-6770
email: dohandley@mail.arc.nasa.gov
http://astrobiology.arc.nasa.gov/Academy/

US mail NASA Ames Research Center
MS 245-1
Moffet Field, CA 94035-1000

Applications for the Academy programs are available on-line beginning in December. Check the Academy homepage at the addresses above for application availability and due dates.

"The Academy is the closest thing to having your brain launched from an aircraft carrier: a very exhilarating, challenging, and time limited experience that you will never forget.

"A decision to go to the NASA Academy is a decision to push your personal and professional envelopes to their limits. If you are ready to give completely to research, discovery, leadership, and group efforts then the Academy will help you to maximize your potential in your corner of the American Space Effort.

"It ain't Space Camp. It ain't Star Trek. The Academy is as real as it gets for college students." - David V. '95